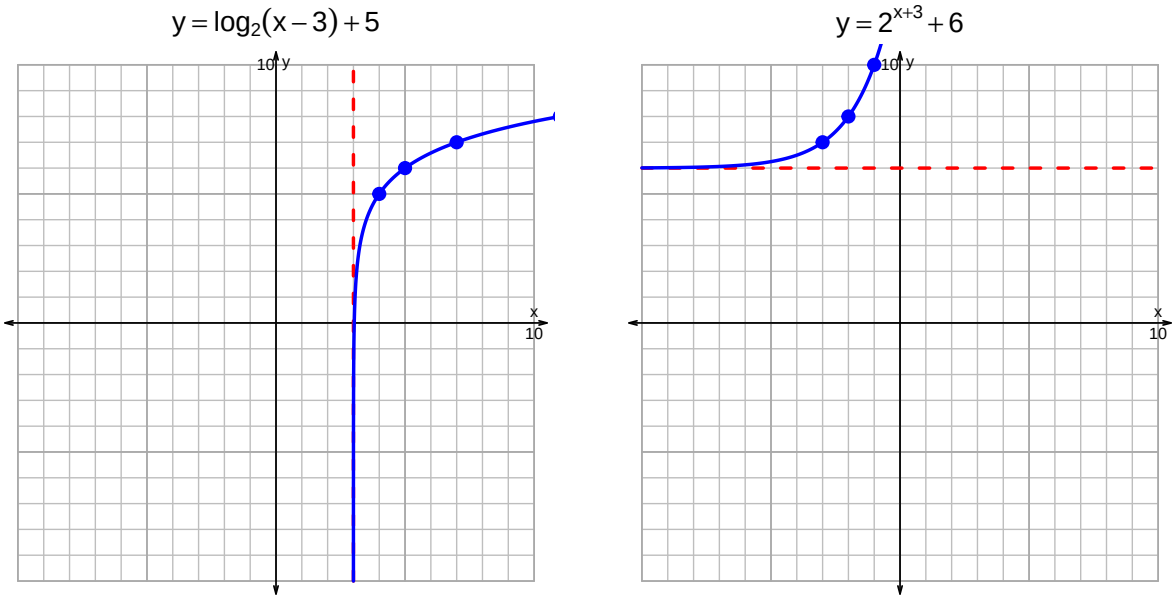
Name: Date:

s18quiz: EXP LOG (Solution v142)

1. Graph $y = \log_2(x-3)+5$ and $y = 2^{x+3}+6$ on the grids below. Also, draw any asymptotes with dotted lines.



2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$23 = \left(\frac{3}{7}\right) \cdot 2^{-4t/5}$$

Divide both sides by $\frac{3}{7}$.

$$\frac{23 \cdot 7}{3} = 2^{-4t/5}$$

Take log, base 2, of both sides.

$$\log_2\left(\frac{23 \cdot 7}{3}\right) = \frac{-4t}{5}$$

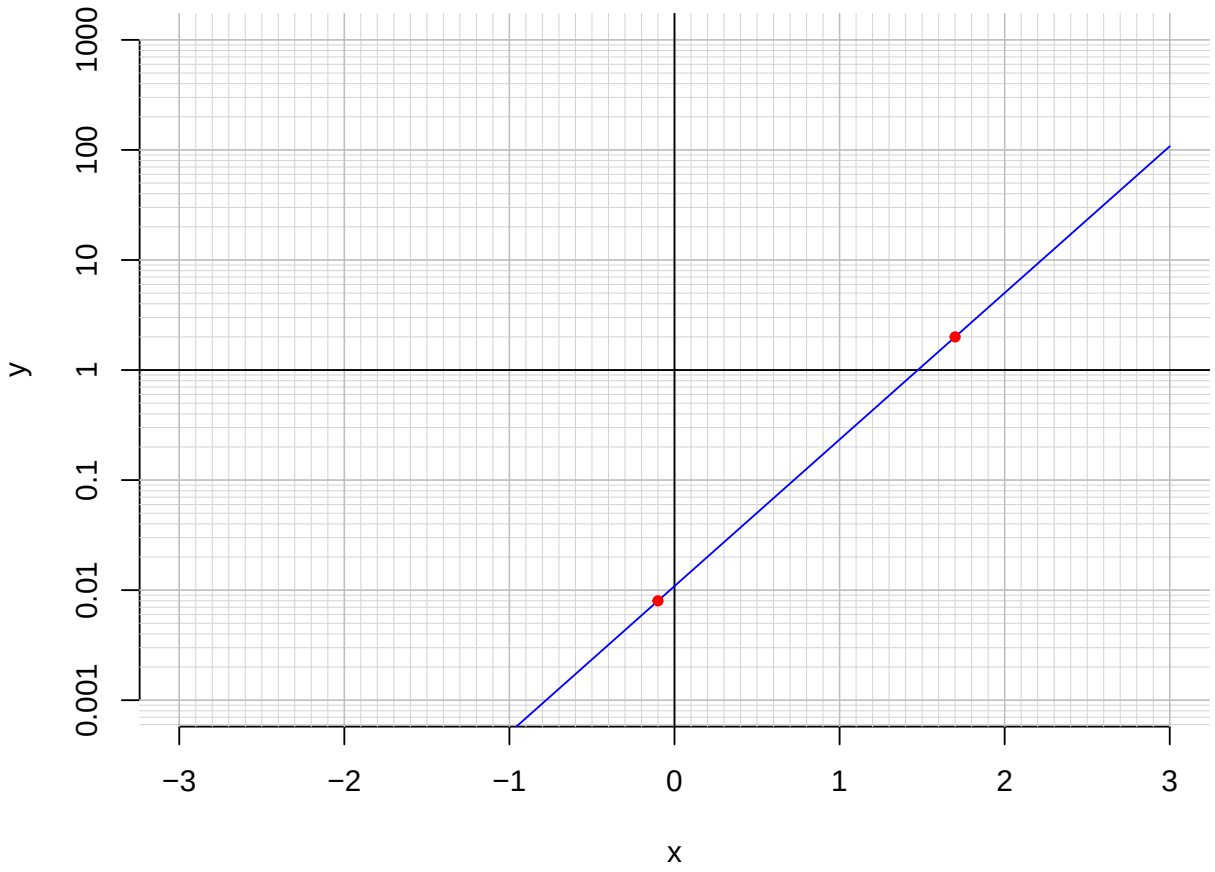
Divide both sides by $\frac{-4}{5}$.

$$\frac{-5}{4} \cdot \log_2\left(\frac{23 \cdot 7}{3}\right) = t$$

Switch sides.

$$t = \frac{-5}{4} \cdot \log_2\left(\frac{23 \cdot 7}{3}\right)$$

3. An exponential function $f(x) = 0.0109 \cdot e^{3.07x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(1.7)$.

$$f(1.7) = 2$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{1}{3.07} \cdot \ln\left(\frac{x}{0.0109}\right)$$

c. Using the plot above, evaluate $f^{-1}(0.008)$.

$$f^{-1}(0.008) = -0.1$$